

## SEAMAP-SA Shallow Water Trawl Survey Cruise Report Fall 2005

The fall cruise for the SEAMAP-South Atlantic Shallow Water Trawl Survey began on October 10 and was completed on November 9, 2005. All of the one hundred and two stations allocated to the twenty-four shallow coastal strata in the South Atlantic Bight were sampled (Figure 1).

Preliminary analysis on species of primary importance was completed and is as follows:

### General Observations:

A total of 133 species or genera were identified in fall trawls (Table 1). The spot, *Leiostomus xanthurus*, was the most abundant species, constituting 19% of total abundance, followed by the Atlantic croaker, *Micropogonias undulatus* (13%); the white shrimp, *Litopenaeus setiferus* (10%); the butterfish, *Peprilis triacanthus* (7%); and the weakfish, *Cynoscion regalis* (6%).

The abundance of individuals, excluding cannonball jellies, ( $n=330,876$  individuals,  $\bar{x}/\text{tow}=3244$  individuals) in 2005 exceeded all previous estimates of abundance recorded during fall cruises (Figure 2). Miscellaneous invertebrate biomass, including cannonball jellies, ( $n=4995$  kg,  $\bar{x}/\text{tow}=49.5$  kg), also increased in 2005; however, miscellaneous invertebrate biomass did not approach record levels. Overall abundance was greatest in Raleigh Bay ( $n=141,382$  individuals,  $\bar{x}/\text{tow}=14,138$  individuals), whereas miscellaneous invertebrate biomass was greatest off Georgia ( $n=3457$  kg,  $\bar{x}/\text{tow}=133.0$  kg).

### Sciaenids:

The assertion that patterns of abundance from SEAMAP trawls in the SAB generally reflect fluctuations in the abundance of the sciaenid family, especially Atlantic croaker and spot, certainly proved true in fall 2005. Spot and Atlantic croaker were the numerically dominant species and together constituted approximately 33% of all abundance and both species, as well as weakfish, reached record levels of abundance, primarily due to large catches of sciaenids in Raleigh Bay (Figure 3). The spot, *Leiostomus xanthurus*, ( $n=63,785$  individuals,  $\bar{x}/\text{tow}=625.3$  individuals) ranked first in abundance overall. The Atlantic croaker, *Micropogonias undulatus*, ( $n=44,364$  individuals,  $\bar{x}/\text{tow}=434.9$  individuals), was the second most numerous species collected. *Cynoscion regalis*, the weakfish, ( $n=19,022$  individuals,  $\bar{x}/\text{tow}=186.5$  individuals) ranked fifth in abundance among all species. The southern kingfish, *Menticirrhus americanus*, ( $n=5894$  individuals,  $\bar{x}/\text{tow}=57.8$  individuals) were more abundant than in fall 2004. Historically, the southern kingfish has exhibited the highest frequency of occurrence of all priority species taken in SEAMAP-SA trawls. In fall 2005 southern kingfish were taken in over 80% of all tows; however, spot were taken in over 84% of tows.

Otoliths were collected from specimens of weakfish ( $n=182$ ), Atlantic croaker ( $n=281$ ), and southern kingfish ( $n=431$ ). Additionally, gonad samples were collected for verification of onboard maturity assessments.

## Mackerel:

King mackerel, *Scomberomorus cavalla*, ( $n=1016$ ,  $\bar{x}/\text{tow}=10.0$ ) decreased in 2005 from the second highest level of fall abundance observed in 2004 (Figure 4). King mackerel were most abundant in waters off Florida ( $n=703$ ,  $\bar{x}/\text{tow}=37.0$ ).

The abundance of Spanish mackerel, *S. maculatus*, ( $n=841$ ,  $\bar{x}/\text{tow}=8.2$ ) reached the second highest fall abundance observed in SEAMAP-SA catches. Abundance of *S. maculatus* was greatest in waters off Florida ( $n=521$ ,  $\bar{x}/\text{tow}=27.4$ ).

## Penaeid Shrimp:

The white shrimp, *Litopenaeus setiferus*, was the most abundant commercially important shrimp species ( $n=33,156$ ,  $\bar{x}/\text{tow}=325.1$ ), ranking first in abundance among decapod crustaceans and third among all species collected during the fall cruise. White shrimp abundance reached the second highest level observed in fall collections. *L. setiferus* were taken from strata in all regions (Figure 5), but the highest mean catch per tow was taken off Florida ( $n=23,501$ ,  $\bar{x}/\text{tow}=1236.9$ ). Over 99% of the females sampled had undeveloped gonads (Figure 6). Less than 1% of the female specimens were found to be mated and none had ripe ovaries. Approximately 95% of the male white shrimp had developing spermatophores, and none had ripe spermatophores.

The brown shrimp, *Farfantepenaeus aztecus*, was the second most abundant commercially important shrimp ( $n=5385$ ,  $\bar{x}/\text{tow}=52.8$ ) taken in fall collections. Abundance of brown shrimp in fall 2005 exceeded all other fall catches. *F. aztecus* were collected in all regions. The greatest mean catch per tow was observed in Raleigh Bay ( $n=1505$ ,  $\bar{x}/\text{tow}=150.5$ ) and Onslow Bay ( $n=2891$ ,  $\bar{x}/\text{tow}=170.1$ ). Over 88% of the females had undeveloped ovaries. None of the female *F. aztecus* specimens had ripe ovaries and less than 1% female brown shrimp collected were mated. Approximately 96% of the male brown shrimp had developing spermatophores; however, less than 1% had ripe spermatophores.

The abundance of the pink shrimp, *Farfantepenaeus duorarum*, ( $n=3$ ,  $\bar{x}/\text{tow}=0.03$ ) in fall 2005 was the lowest level observed during SEAMAP-SA fall cruises. All pink shrimp were taken in the Onslow Bay. All of the pink shrimp taken were females and none were found to have developing ovaries or to be mated.

Occurrence of black gill disease in commercially important penaeids was observed and recorded (Figure 7). Presence of black gill disease was not noted in any pink shrimp and was found in fewer than 6% of the brown shrimp. White shrimp, however, exhibited the greatest level of infestation, at approximately 12%. Infestation of brown and white shrimp occurred from Onslow Bay southward to Florida, and was greatest in white shrimp taken off South Carolina.

## Other Observations:

The following specimens were retained and transported to SCMRD for cooperating and other investigations:

- Two species of *Menticirrhus* for age and growth research
- *Haemulon aurolineatum*, *Lutjanus synagris*, *Lutjanus compechanus*, and *Lutjanus analis* for age-growth research (MARMAP)
- Weakfish and bluefish specimens for age and growth research
- Specimens of *Etropus crossotus* for fecundity study
- *Symphurus plagiura* for species verification

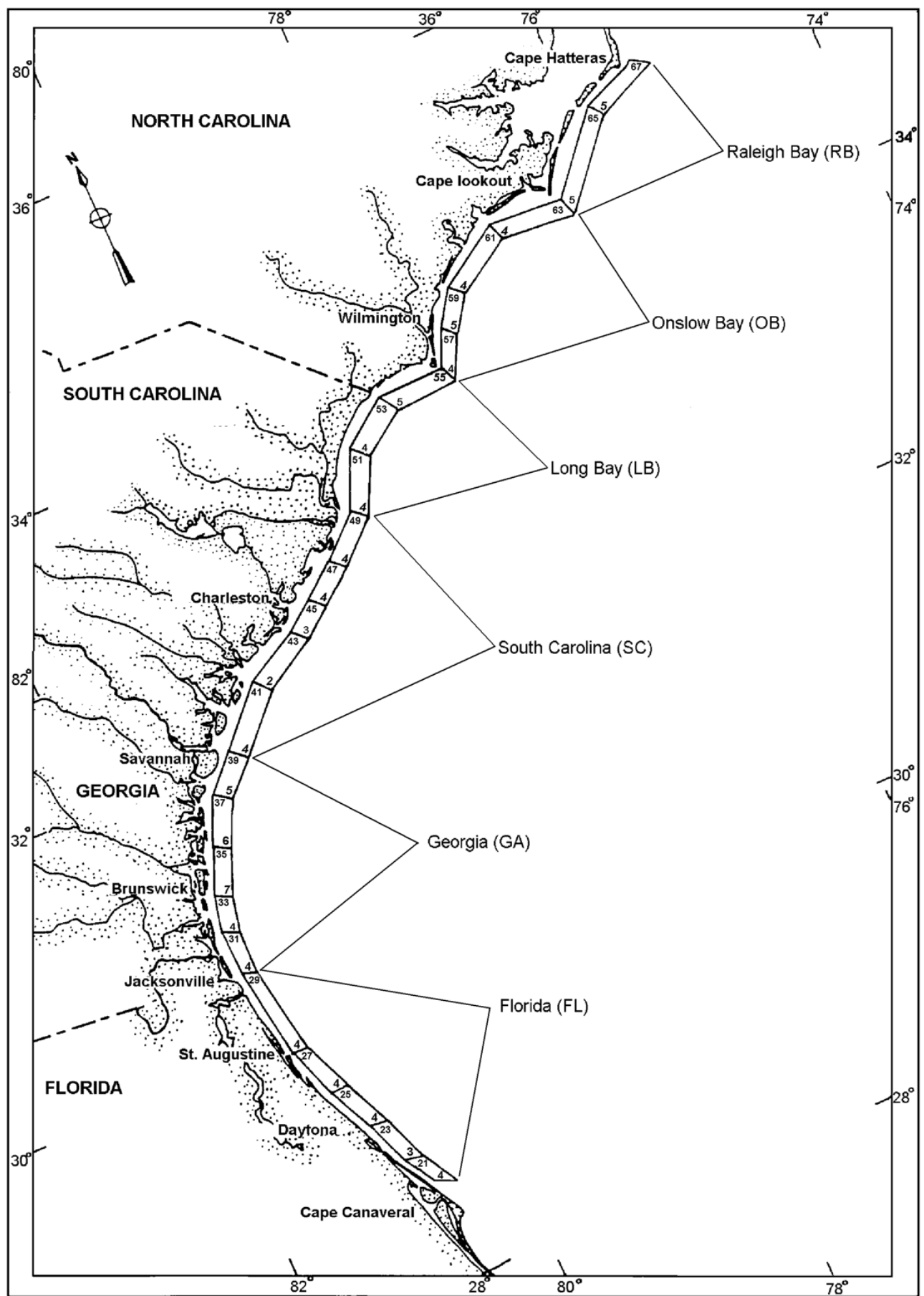


Figure 1. SEAMAP strata sampled in 2005. Stratum number is indicated at the top of each rectangle and number of trawls towed is located in the lower portion of each stratum.

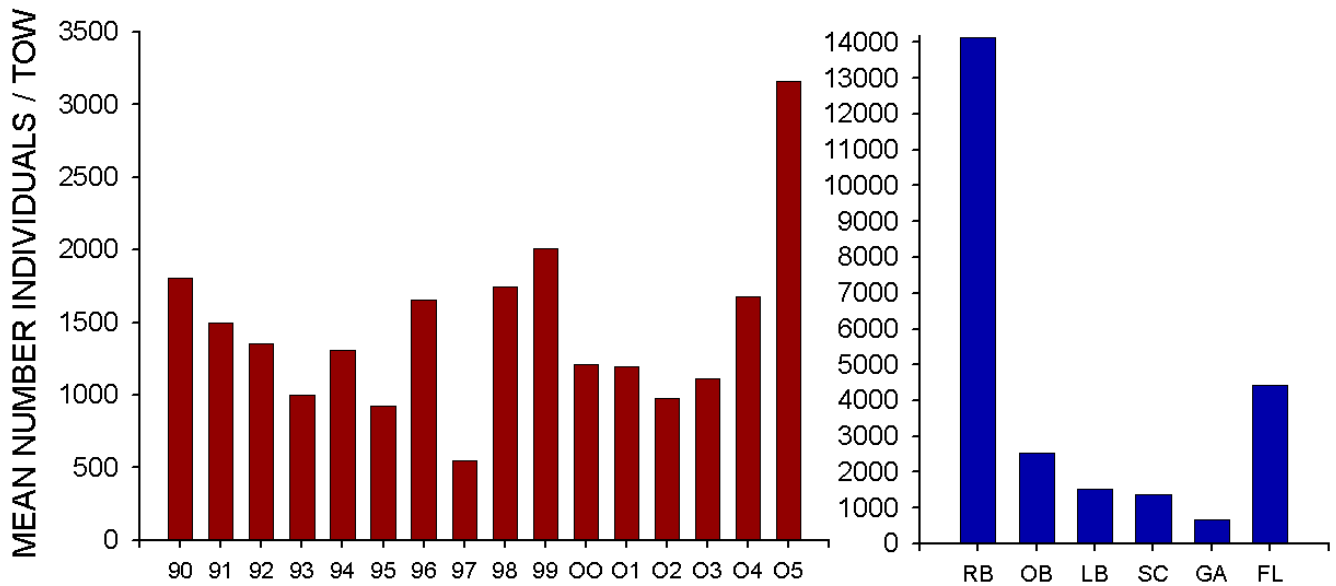
Table 1. Abundance and biomass of species collected in fall 2005.

Rank	Species name	Individuals	Weight (kg)
1	Leiostomus xanthurus	63785	6526.344
2	Micropogonias undulatus	44364	2430.582
3	Litopenaeus setiferus	33156	686.954
4	Peprilus triacanthus	21694	865.011
5	Cynoscion regalis	19022	1638.889
6	Stellifer lanceolatus	15884	378.106
7	Trichiurus lepturus	14306	301.580
8	Peprilus alepidotus	13552	552.165
9	Larimus fasciatus	11542	987.035
10	Selene setapinnis	10931	75.222
11	Bairdiella chrysoura	10922	435.411
12	Anchoa hepsetus	9622	123.051
13	Lagodon rhomboides	9255	394.380
14	Chloroscombrus chrysurus	7499	72.070
15	Menticirrhus americanus	5894	649.448
16	Farfantepenaeus aztecus	5385	92.099
17	Lolliguncula brevis	5309	68.579
18	Pomatomus saltatrix	3449	275.935
19	Opisthonema oglinum	3286	84.658
20	Cynoscion nothus	2605	69.907
21	Selene vomer	2231	40.393
22	Orthopristis chrysoptera	1937	86.854
23	Scomberomorus cavalla	1016	31.158
24	Gymnura micrura	990	705.996
25	Synodus foetens	943	107.513
26	Anchoa mitchilli	873	0.982
27	Chaetodipterus faber	855	44.952
28	Scomberomorus maculatus	841	61.863
29	Stenotomus sp.	729	37.894
30	Urophycis regius	565	50.824
31	Raja eglanteria	483	477.796
32	Callinectes similis	460	6.574
33	Dasyatis sayi	394	383.535
34	Sphyræna guachancho	373	9.245
35	Etropus crossotus	369	6.831
36	Ovalipes stephensoni	337	4.105
37	Libinia dubia	328	1.497
38	Menticirrhus littoralis	323	87.811
39	Decapterus punctatus	315	25.817
40	Portunus gibbesii	306	1.719
41	Paralichthys dentatus	268	47.588
42	Rhizoprionodon terraenovae	254	219.086
43	Rhinoptera bonasus	231	1607.658
44	Trachinotus carolinus	195	28.933
45	Arenaeus cribrarius	193	2.889

Rank	Species name	Individuals	Weight (kg)
46	Scophthalmus aquosus	191	10.568
47	Brevoortia tyrannus	189	10.808
48	Loligo sp.	186	2.296
49	Myliobatis freminvillei	183	217.286
50	Eucinostomus sp.	180	5.011
51	Trinectes maculatus	167	5.158
52	Sphyrna tiburo	146	189.819
53	Prionotus scitulus	121	2.898
54	Ovalipes ocellatus	120	1.605
55	Caranx hippos	119	7.483
56	Anchoa lyolepis	115	0.121
57	Pogonias cromis	108	10.879
58	Prionotus carolinus	105	1.539
59	Harengula jaguana	101	2.590
60	Dasyatis sabina	100	28.354
61	Squilla empusa	100	1.689
62	Gymnura altavela	91	1020.024
63	Prionotus evolans	76	3.790
64	Xiphopenaeus kroyeri	70	0.506
65	Portunus spinimanus	70	1.170
66	Bagre marinus	68	7.140
67	Libinia emarginata	57	0.742
68	Squilla neglecta	57	0.734
69	Dasyatis americana	55	42.745
70	Centropristis striata	53	4.444
71	Chilomycterus schoepfi	49	10.522
72	Dasyatis centroura	46	564.965
73	Sphoeroides maculatus	46	7.119
74	Centropristis philadelphica	43	1.582
75	Citharichthys macrops	40	0.513
76	Stephanolepis hispidus	39	0.276
77	Symphurus plagiusa	35	0.919
78	Pagurus pollicaris	34	1.715
79	Caranx crysos	32	1.542
80	Cynoscion nebulosus	31	4.677
81	Paralichthys lethostigma	29	8.218
82	Citharichthys spilopterus	24	0.417
83	Archosargus probatocephalus	23	62.108
84	Echeneis naucrates	18	3.498
85	Menippe mercenaria	17	3.214
86	Oligoplites saurus	15	0.221
87	Diapterus olisthostomus	15	0.205
88	Strongylura marina	14	26.169
89	Lutjanus griseus	14	0.255
90	Prionotus salmonicolor	14	0.299

Rank	Species name	Individuals	Weight (kg)
91	Prionotus tribulus	13	0.922
92	Rimapenaeus constrictus	13	0.016
93	Callinectes sapidus	13	1.906
94	Trachurus lathami	11	0.324
95	Paralichthys albigutta	10	3.034
96	Caretta caretta	10	464.020
97	Persephona mediterranea	10	0.058
98	Pilumnus sayi	10	0.146
99	Aetobatus narinari	9	53.510
100	Elops saurus	9	1.531
101	Carcharhinus limbatus	7	54.780
102	Callinectes ornatus	7	0.153
103	Carcharhinus acronotus	5	73.470
104	Ancylorsetta quadrocellata	5	0.676
105	Odontaspis taurus	4	380.000
106	Diplectrum formosum	3	0.059
107	Umbrina coroides	3	0.040
108	Carcharhinus brevipinna	3	88.140
109	Lutjanus synagris	3	0.092
110	Lepidochelys kempi	3	40.700
111	Farfantepenaeus duorarum	3	0.022
112	Hepatus epheliticus	3	0.048
113	Sphyrna lewini	2	3.320
114	Ogcocephalus rostellum	2	0.013
115	Brevoortia smithi	2	0.936
116	Calappa flammea	2	0.300
117	Portunus sayi	2	0.014
118	Octopus vulgaris	2	0.808
119	Carcharhinus isodon	2	6.370
120	Carcharhinus plumbeus	1	6.480
121	Rhinobatos lentiginosus	1	0.083
122	Acipenser oxyrinchus	1	20.950
123	Syngnathus louisianae	1	0.010
124	Rachycentron canadum	1	3.550
125	Lutjanus analis	1	0.046
126	Lutjanus campechanus	1	0.005
127	Menticirrhus saxatilis	1	0.203
128	Mugil curema	1	0.027
129	Astroscopus y-graecum	1	0.036
130	Syacium papillosum	1	0.155
131	Upeneus parvus	1	0.035
132	Etropus cyclosquamus	1	0.005
133	Dermochelys coriacea	1	120.000

## OVERALL ABUNDANCE



## INVERTEBRATE BIOMASS

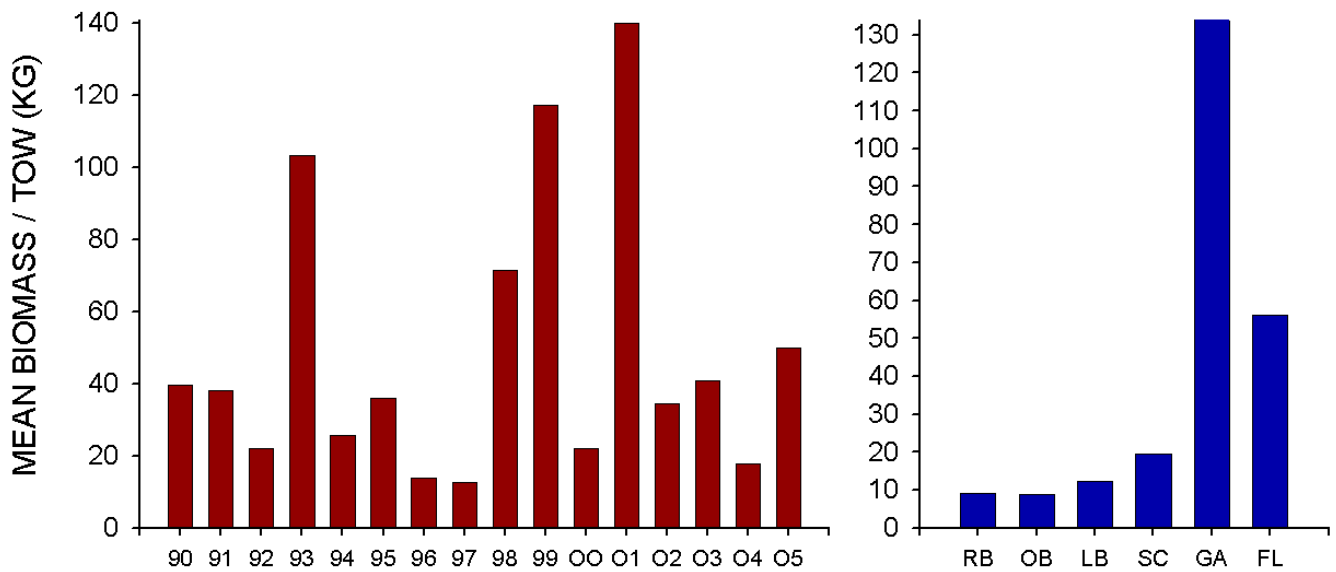


Figure 2. Annual and regional (2005) fall estimates of overall abundance and invertebrate biomass from inner strata

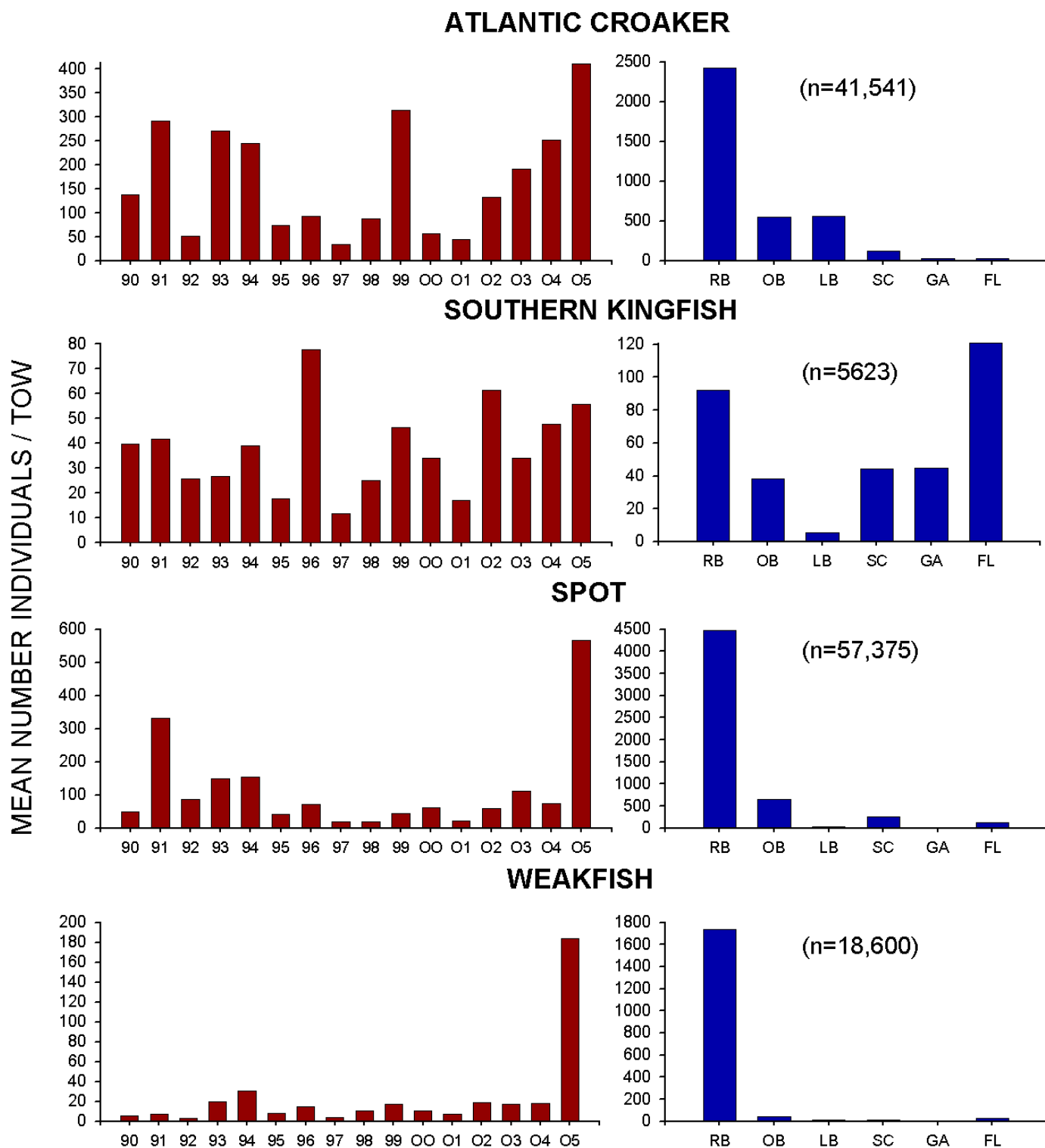


Figure 3. Annual and regional (2005) fall abundances of numerically dominant sciaenids from inner strata

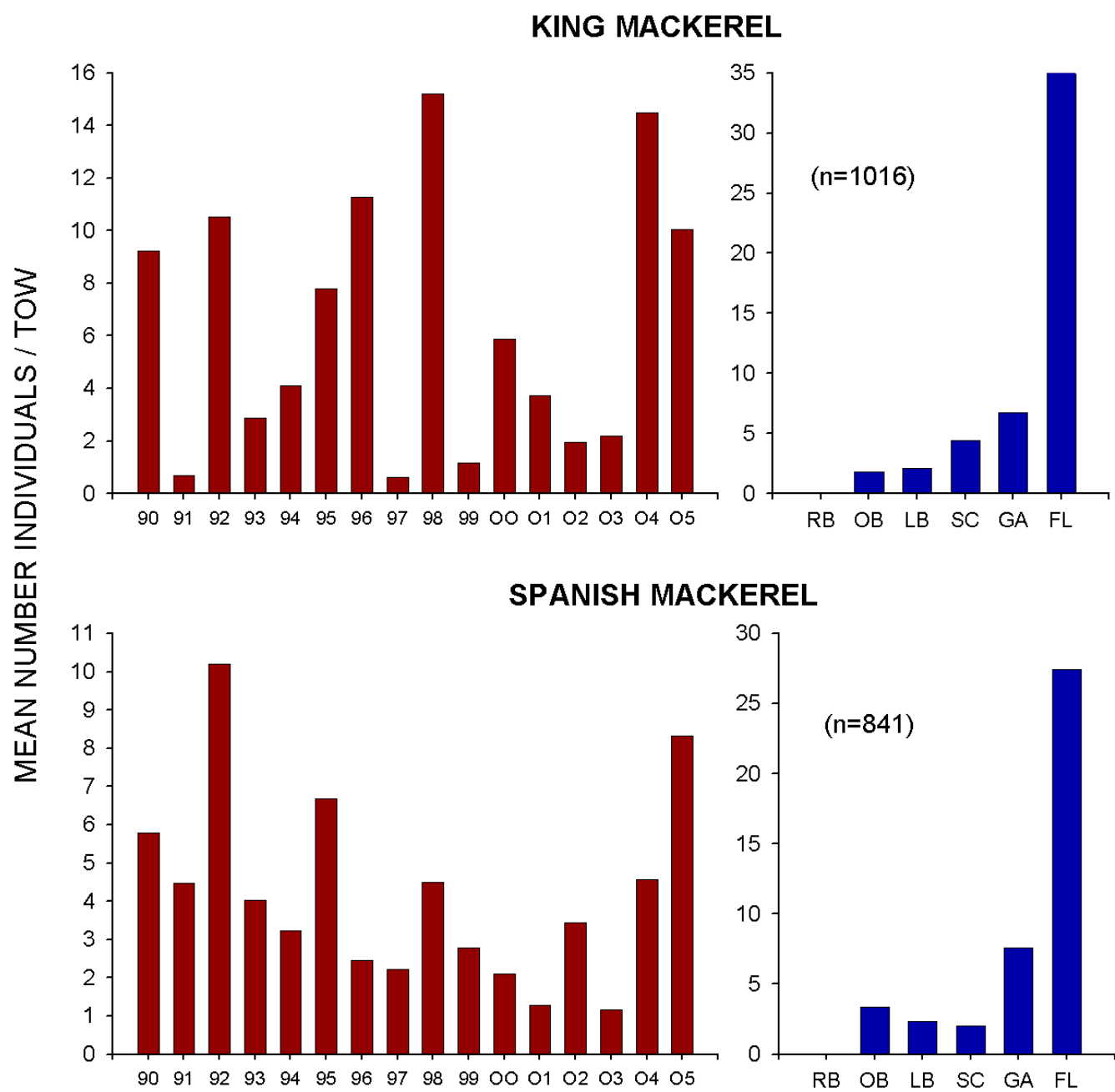


Figure 4. Annual and regional (2005) fall abundances of mackerels from inner strata

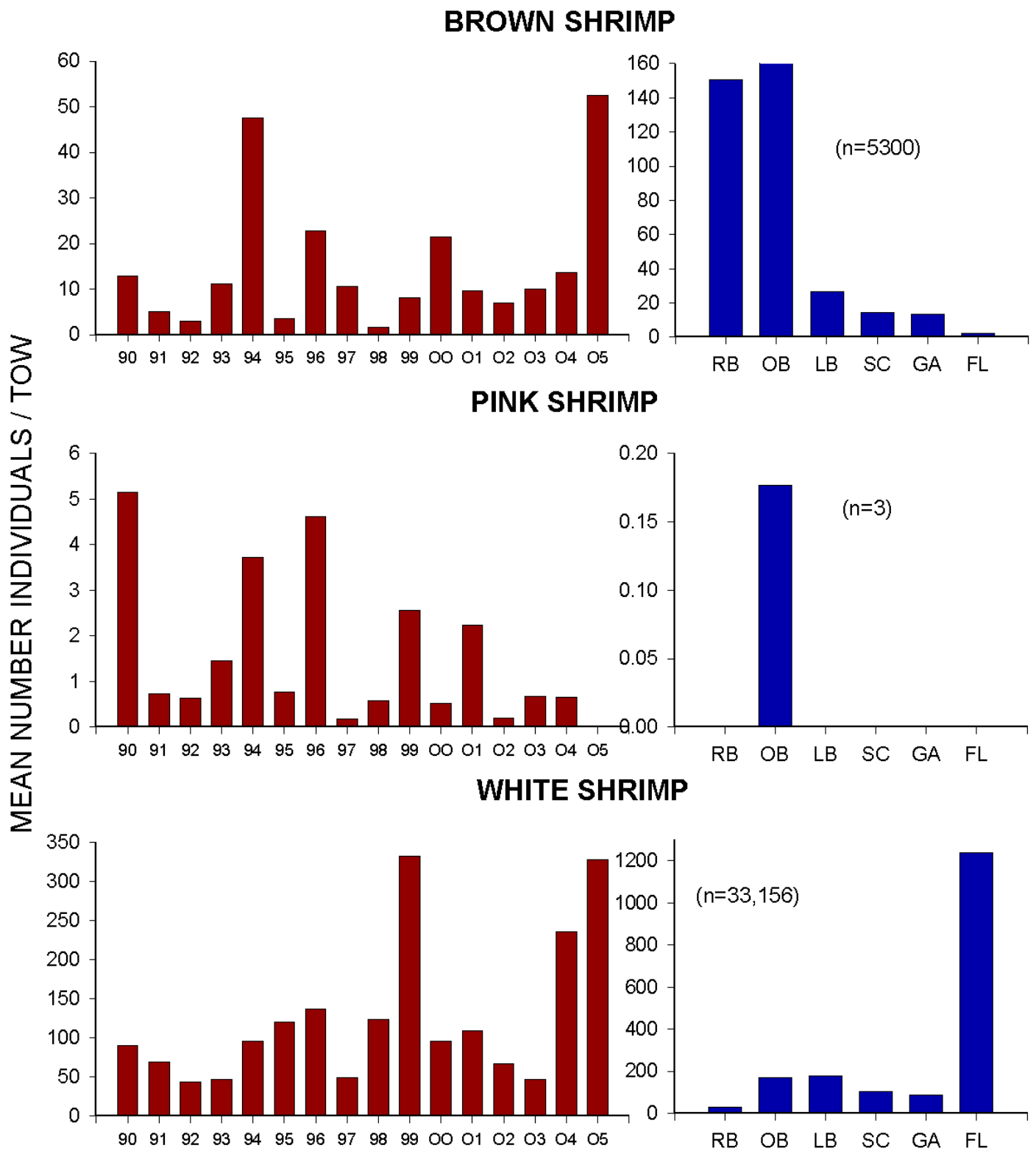


Figure 5. Annual and regional (2005) fall shrimp abundances from inner strata



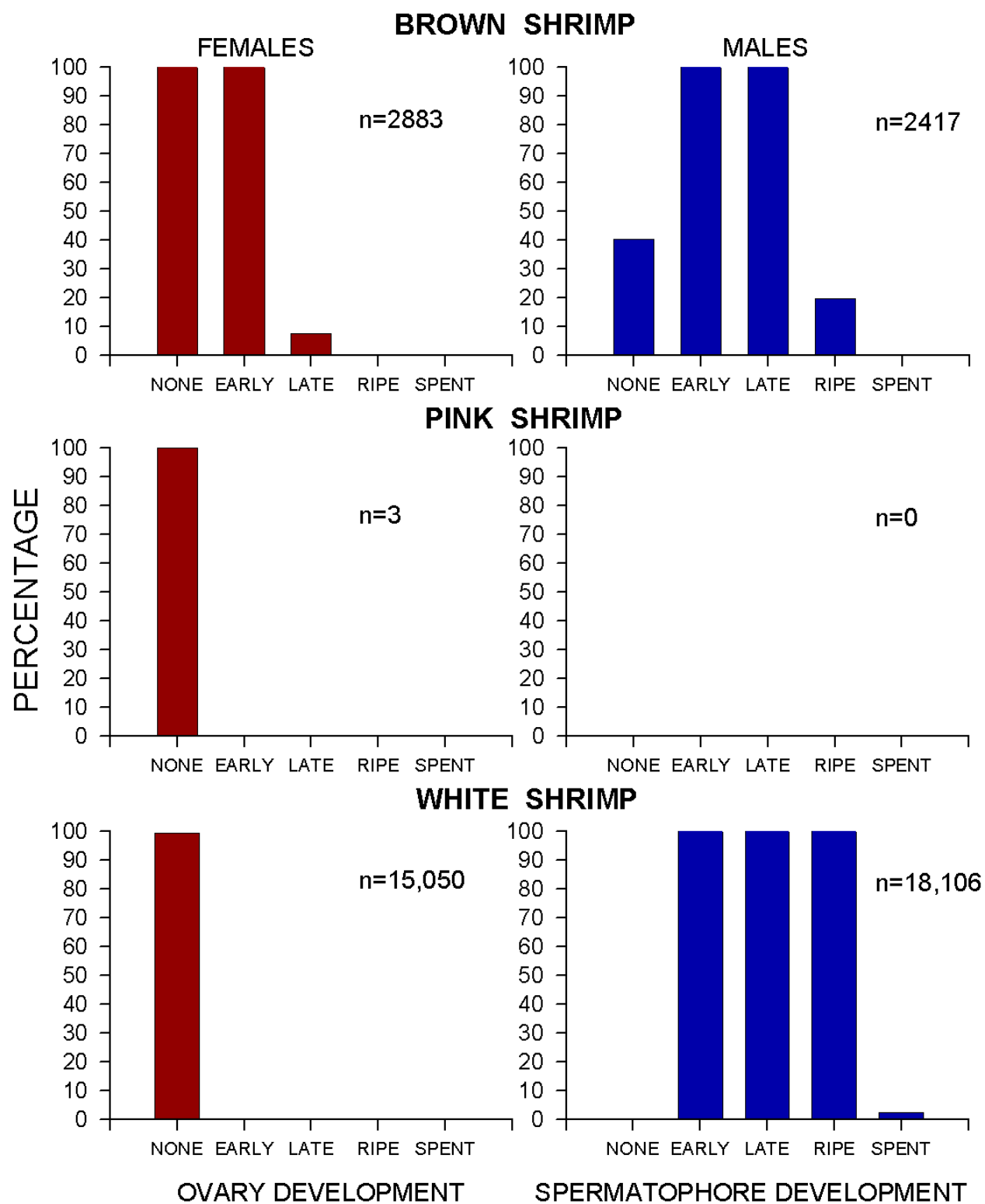


Figure 6. Shrimp gonadal development - Fall 2005

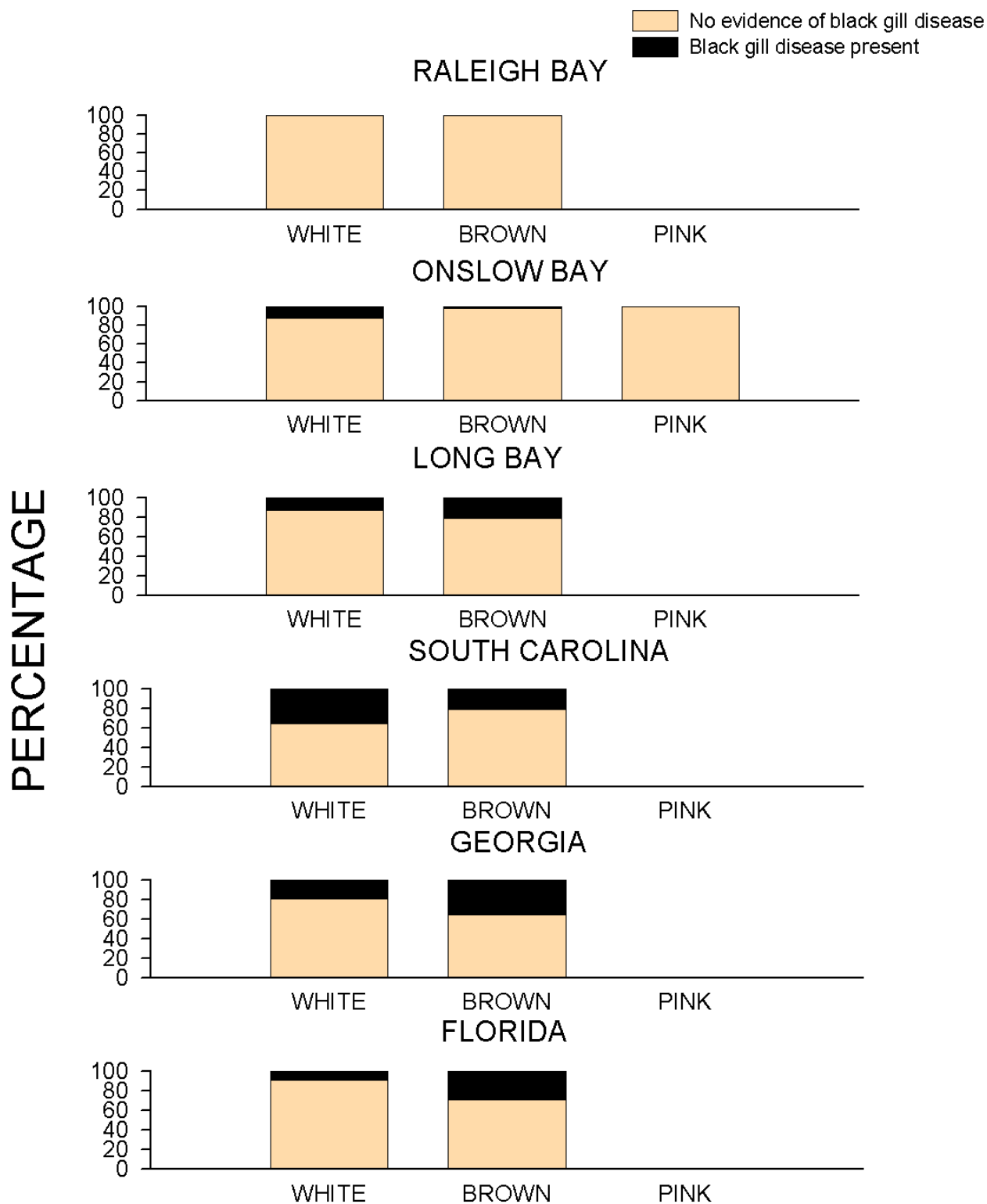


Figure 7. Incidence of black gill disease in penaeid shrimp taken in SEAMAP-SA trawls in Fall 2005.